

STATEMENT OF BASIS

American Foam Cast, Inc.
Sylacauga, AL
Talladega County
309-0044

This proposed Title V Major Source Operating Permit renewal is issued under the provisions of ADEM Admin. Code r. 335-3-16. The above name applicant has requested authorization to perform the work or operate the facility shown on the application and drawing, plans, and other documents attached herto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit.

American Foam Cast, Inc. (AFC) located in Sylacauga, Alabama operates a lost foam aluminum foundry. The facility produces aluminum alloy castings for the automotive, marine, and heavy truck industries.

The following are significant sources of air pollution for this facility:

- EPS Molding and Casting Unit
- Two Aluminum Melting Furnaces
- Three Shotblast Machines
- Thermal Reclamation Unit
- Foam Pattern Making Process

EPS Molding and Casting Unit

Process Description:

AFC produces aluminum alloy castings using the lost foam casting process. For each part produced, a polystyrene foam replica is produced. The foam replica is assembled into cluster by gluing styrene trees. The assembly is then coated with a fine refractory slurry, dried, then embedded in un-bonded mullite grain and cast with aluminum alloy. The heat in the molten metal melts and/or vaporizes the foam forming a cavity which is displaced by molten metal. Upon solidification, the alloy freezes in the shape of the styrene pattern in the form of the desired part. After solidification and cooling, the tree of parts is removed from the processing flask. The mullite grain is cooled and returned to the sand system for recycling. The casting are cut off the tree and cleaned by shotblasting, finished, inspected, and packed for shipment.

Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code r. 335-3-4-.04(1), “Control of Particulate Emissions for Process Industries – General”.
- This process is subject to ADEM Admin. Code r. 335-3-4-.01(1), “Control of Particulate Emissions – Visible Emissions”.

- This unit has an enforceable limit in order to prevent them from being subject to the provisions of ADEM Admin. Code r. 335-3-14-.04, “Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration].”
- The Foam Casting Operation must comply with the applicable requirements of 40 CFR Part 63 Subpart ZZZZZZ, “National Emission Standards for Hazardous Air Pollutants for Aluminum, Copper and other Nonferrous Foundries” by June 27, 2011 or by alternative date established by Subpart ZZZZZZ.
- This unit is subject to 40 CFR 64, Compliance Assurance Monitoring. Pre-control potential particulate matter emissions exceed 100 TPY.

Emissions Standards:

- Opacity
 - ADEM Admin Code r. 335-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) percent opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.
- Particulate Matter
 - Particulate matter emissions from the EPS Casting/Molding unit shall not exceed the lesser of the Anti-PSD limit of 23.78 lbs/hr as required by ADEM Admin Code r. 335-3-14-.04

OR

the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62} \text{ (P less than 30 tons per hour)}$$

$$E = 17.31 (P)^{0.16} \text{ (P greater than 30 tons per hour)}$$

Where E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

Compliance and Performance Test Methods and Procedures:

- If testing is required, particulate matter(PM) emissions shall be determined in accordance with Method 5 of 40 CFR 60, Appendix A. *(ADEM Admin.Code r. 335-3-1-.05)*
- Method 9 of 40 CFR 60, Appendix A, or an equivalent method approved by the Department shall be used in the determination of the opacity of the stack emissions. *(ADEM Admin.Code r. 335-3-1-.05)*

Emission Monitoring:

This unit is subject to the applicable emission monitoring requirements of ADEM Admin. Code r. 335-3-16-.05.

- ADEM Admin. Code r. 335-3-16-.05:
 - The permittee shall perform the following inspections of the baghouse to verify proper operation:

- 1) Once per month check hopper, fan, and cleaning cycle for proper operation.
 - 2) Once per month perform a visual check of all hoods and ductwork.
- The permittee shall perform the following inspections of the baghouse to verify proper operation:
- 1) Once per year inspect baghouse structure, access doors, door seals, and bags.
 - 2) Once per year perform an internal inspection of the baghouse hoppers.

CAM Analysis:

Particulate Matter

- The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;
- This unit has a limit on PM emissions of 23.78 (lb/hr) pounds per hour.
- This unit uses a control device (baghouse) to achieve compliance with the PM limitation.
 - A baghouse reduces PM emissions with a removal efficiency of 99%.
- The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. For purposes of this paragraph, “potential pre-control device emissions” shall have the same meaning as “potential to emit,” as defined in §64.1, except that emission reductions achieved by the applicable control device shall not be taken into account.

- Based on an emission test performed on a similar unit this **unit has the pre-controlled potential to emit particulate matter equal to or greater than 100 percent of the amount required to be classified as a major source.**
- Since the allowable emissions standard of the lesser of 23.78 lbs/hr required by ADEM Admin Code r. 335-3-14-.04 or the allowable set by ADEM Admin Code r 335-3-4-.04(1) exceeds 100 TPY for this unit, AFC has requested to limit the hours of operation to 4,800 hours in any consecutive twelve month period. By limiting the hours of operation, the following PM emissions would ensure that the potential to emit, including the effect of control devices, is less than 100 TPY. The limit would prevent the facility from being required to collect four or more data values as required in §64.3(b)(4)(i).

Expected Emissions

The expected emissions are as follows:

Pollutant	Expected Emissions (lb/hr)	Expected Emissions (TPY)
PM	23.8	57.1
Styrene	21.9	40
Benzene	.12	.24
Toluene	1.17	2.4
Ethyl Benzene	3.45	6.9
X-Methyl Styrene	.18	.37
Cumene	.16	.33

- This unit shall not operate more than 4,800 hours in any consecutive twelve month period.

Monitoring

- The facility proposes the following monitoring to satisfy the requirements of CAM:

	Indicator 1	Indicator 2
I. Indicator	Differential Pressure	Visible Emission
Measurement Approach	Measured using a Magnehelic Differential Pressure Gauge	Visual inspection of the baghouse stack
II. Indicator Range	While the unit is operation, an excursion is defined as a pressure differential below 2.0 inches of H ₂ O or greater than 7.0 inches of H ₂ O. Excursions trigger an inspection, corrective action, and a reporting requirement.	Baghouse stack visual emission opacity should be less than 5%. Excursions of opacity shall not exceed 10% for more than 4 hrs. Excursions trigger an inspection, corrective action, and a reporting requirement. If an excursion is noted and not corrected within a period of one hour, then a method 9 must be performed with four hours of the observation.
III. Performance Criteria		
Data Representativeness	The pressure gauge measures the pressure differential between the inlet and outlet of the baghouse.	Baghouse shell is visually inspected for deterioration. If needed, it is repaired or replaced. Broken or leaking filter bags are replaced.
Verification of Operation Status	Not applicable	Not applicable
QA/QC Practices and Criteria	The pressure gauge shall be calibrated annually. If abnormal pressure is found, the gauge shall be inspected and corrected or replaced.	Opacity readings shall be taken by a person fully trained and qualified according to EPA standards. Gauge calibration shall be conducted when erratic reading are displayed, or at least annually.
Monitoring Frequency	The pressure differential shall be monitored and logged daily.	The complete Baghouse Unit shall be inspected at least annually. The visual emission shall be performed daily.
Data Collection Procedures	The pressure differential will be recorded with the time, date, and name of the observer.	A record of the results of the Baghouse inspection shall be kept with the time, date, bags condition and number replaced.
Averaging Period	Instantaneous	Instantaneous

Justification

Rationale for Selection of Performance Indicators

Visible emissions were selected as a performance indicator because it is indicative of good operation and maintenance of the fabric filter. When the equipment is properly operating, visible emissions will maintain a consistently normal appearance. If the exhaust plume should change in overall appearance, there is a likelihood that the fabric filter may have entered into an upset condition that must be investigated to determine the cause of the abnormal emission. The most likely causes of increased visible emissions from a fabric filter is broken bags or condensation of high moisture content exhaust air.

In general, the fabric filter will operate within a prescribed range of pressure drops based on the airflow being delivered to the equipment. If the pressure drop readings change dramatically or fall outside of the specified range, an investigation must be performed to determine the cause of the change in readings and remedial actions performed, if required. The most likely causes of a change in pressure drop are either broken or blinded filter bags, clogged inlet lines, or a significant reduction in airflow to the collector.

Proper maintenance of the auxiliary equipment is essential to proper operation of the baghouse. Therefore, AFC will conduct weekly inspections of the hopper, fan, cleaning cycle, hoods, and ductwork. Additionally, AFC will complete an internal inspection of all structures, access doors, bags, and hoppers once per twelve month period.

Rationale for Selection of Indicator Ranges

The selected indicator for visible emissions is a change from normal appearance. The observer will be trained to recognize normal emissions from the exhaust so that in the

event there is a change in appearance of the exhaust plume; an investigation into its cause can be initiated. Some visible emissions are detected at the exhaust monovalent due to the presence of some particulate not captured on the fabric filter (fabric filter removal efficiency is estimated at 99%). This is considered a normal condition. If a consistent change in the color, consistency, or other appearance feature of the plume is noted, it will be documented as an excursion. When an abnormal condition exists, maintenance will be notified of the excursion, and will instigate an investigation to determine the cause of the visible emission. Once determined, the cause of the excursion will be documented and any necessary maintenance activities required to correct the visible emissions will be scheduled and performed at a time such that the impact to operations are minimized while insuring that no emissions limits are violated. All results of the investigation and any maintenance activity associated with the correction will be documented. No formal report will be required unless it is determined that an emission limit has been exceeded.

The selected indicator for the fabric filter unit is a pressure drop less than 2.0 inches of H₂O or greater than 7.0 inches of H₂O. Whenever the pressure drop is above or below the range of 2 to 7 inches of H₂O an investigation into its cause will be initiated. The wide range of values is required because of the variability in airflow to the fabric filter unit. Low production will lead to low airflow with high production yielding a corresponding high airflow. If the pressure drop reading has fallen outside of the range, maintenance staff will be notified of the excursion, and will instigate an investigation to determine the cause of the unusual reading. Once determined, the cause of the excursion will be documented and any necessary maintenance activities required to correct the unusual pressure drop will be scheduled and performed. The activities will occur at a time such that the impacts to operations are minimized, while insuring that no emissions limits are violated. All results of the investigation and any maintenance activity

associated with the correction will be documented. No formal report will be required unless it is determined that an emission limitation has been exceeded.

Recordkeeping and Reporting Requirements:

- The Permittee shall maintain a record of all inspections performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. (*ADEM Admin. Code r. 335-3-16-.05(c)(3)*).
- This source is subject to the applicable requirements of 40 CFR Part 64, "Compliance Assurance Monitoring" to include the Reporting and Recordkeeping Requirements in §64.9 (40 CFR Part 64 – CAM).
- The Permittee shall record the baghouse pressure daily. Any deviations from the pressure range shall be documented along with the corrective action and reported to the Department within two (2) working days. Each record shall be maintained for a period of 5 years (40 CFR Part 64 – CAM).
- Records of monthly and rolling 12-month total of hours of operation shall be recorded in a form suitable for inspection and these records shall be maintained for a minimum of 5 years. (*ADEM Admin. Code r. 335-3-16-.05(c)(3)*).

Aluminum Melting Furnaces

Aluminum alloy ingot and foundry remelt are placed on the hearth of either of the two furnaces via a front end loader. The charge materials are heated by combustion of natural gas to 1450 – 1500 °F. Melted aluminum flows and is collected at the opposite end of the furnace in a well. The molten aluminum is maintained at the desired process temperature, degassed, and then poured into flasks containing refractory coated trees of poly-styrene pattern replicas of the desired part invested by mullite grain. The molten aluminum burns, vaporizes, and fills the evacuated cavity forming the cast aluminum part.

Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code r. 335-3-4-.04(1), “Control of Particulate Emissions for Process Industries – General”.
- This process is subject to ADEM Admin. Code r. 335-3-4-.01(1), “Control of Particulate Emissions – Visible Emissions”.
- This unit has an enforceable limit in order to prevent them from being subject to the provisions of ADEM Admin. Code r. 335-3-14-.04, “Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration].”

Emissions Standards:

- Opacity
 - ADEM Admin Code r. 335-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) percent opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.
- Particulate Matter
 - Particulate matter emissions from the stack associated with the two aluminum melt furnaces shall not exceed the lesser of the Anit-PSD limit of 3.74 lbs/hr as required by ADEM Admin Code r. 335-3-14-.04,

OR

the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62} \text{ (P less than 30 tons per hour)}$$

$$E = 17.31 (P)^{0.16} \text{ (P greater than 30 tons per hour)}$$

Where E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

- Only clean metal such as “pigs”, foundry returns, and similar types of clean aluminum shall be charged or melted in the furnaces. (*ADEM Admin Code r. 335-3-16-.04*)

Expected Emissions:

The maximum expected emissions are as follows:

Pollutant	Expected Emissions (lb/hr)	Expected Emissions (TPY)
PM	.4	1.5
NO_x	.75	2.8

The PM emissions were based on a stack analysis of a similar unit. NO_x emissions were based on AP-42 emissions factors and operating 8,760 hours.

Compliance and Performance Test Methods and Procedures:

- If testing is required, particulate matter(PM) emissions shall be determined in accordance with Method 5 of 40 CFR 60, Appendix A. (*ADEM Admin.Code r. 335-3-1-.05*)
- Method 9 of 40 CFR 60, Appendix A, or an equivalent method approved by the Department shall be used in the determination of the opacity of the stack emissions. (*ADEM Admin.Code r. 335-3-1-.05*)

Emission Monitoring:

- Particulate Matter
 - The facility shall perform a visual check, once per day, of the stack associated with this unit. This check shall be performed by a person familiar with method 9.

If the instantaneous opacity of emissions in excess of 10% are noted, and are not corrected within a period of 1 hour, then a method 9 must be performed within 4 hours of the observations. Maintenance shall be performed as needed. Any repairs or observed problems shall be recorded (*ADEM Admin. Code r. 335-3-16-.05*)

Recordkeeping and Reporting Requirements:

- The facility shall maintain a record of all inspections, to include visible observations and Method 9 observations performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. (*ADEM Admin. Code r. 335-3-16-.05*)
- If a visible emission observation is required using the 40 CFR, Part 60, Appendix A, Method 9, the results will be documented using an ADEM visible emissions observation report and the cause and corrective action taken will be documented in a form suitable for inspection. (*ADEM Admin. Code r. 335-3-16-.05*)

Three Shotblast Machines with Baghouse

Goff Shotblast Machine:

Aluminum castings produced on the EPS Casting Unit are cleaned of refractory coating and mullite grain by a stream of steel shot thrown at high velocity by the blast wheels of this shotblast machine which are set to impinge upon the castings to be cleaned. The castings are placed on rotating hanging fixture within a closed chamber, which is ventilated by the plant baghouse filter dust collection system, thus collecting mullite grain and refractory material particulate. The casting surface is rendered smooth and uniformly enhanced by the process.

Bronco and Delong Shotblast Machines:

Aluminum castings produced on the EPS Casting Unit are cleaned of refractory coating and mullite grain by a stream of steel shot thrown at high velocity by the wheel of this shotblast machine. The castings are placed on a rubber belt that rotates in closed chamber that is ventilated to the plant baghouse filter dust collection system.

Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.

- This source is subject to ADEM Admin. Code r. 335-3-4-.04(1), “Control of Particulate Emissions for Process Industries – General”.
- This process is subject to ADEM Admin. Code r. 335-3-4-.01(1), “Control of Particulate Emissions – Visible Emissions”.
- This unit has an enforceable limit in order to prevent them from being subject to the provisions of ADEM Admin. Code r. 335-3-14-.04, “Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration].”
- This unit is subject to 40 CFR 64, Compliance Assurance Monitoring. Pre-control potential particulate matter emissions exceed 100 TPY.

Emissions Standards:

- Opacity
 - ADEM Admin Code r. 335-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) percent opacity, as determined by a six (6) minute average. During one six (6) minute period a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.
- Particulate Matter
 - Particulate matter emissions from the Goff Shotblast machine shall not exceed the lesser of the Anit-PSD limit of 15.52 lbs/hr as required by ADEM Admin Code r. 335-3-14-.04,

OR

the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62} \text{ (P less than 30 tons per hour)}$$

$$E = 17.31 (P)^{0.16} \text{ (P greater than 30 tons per hour)}$$

Where E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

- Particulate matter emissions from the Bronco Shotblast machine shall not exceed the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62} \text{ (P less than 30 tons per hour)}$$

$$E = 17.31 (P)^{0.16} \text{ (P greater than 30 tons per hour)}$$

Where E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

- Particulate matter emissions from the Delong Shotblast machine shall not exceed the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the

amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62} \text{ (P less than 30 tons per hour)}$$

$$E = 17.31 (P)^{0.16} \text{ (P greater than 30 tons per hour)}$$

Where E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

Expected Emissions:

The maximum expected emissions are as follows:

Pollutant	Expected Emissions (lb/hr)	Expected Emissions (TPY)
PM	.382*	1.67*

* The PM allowable for both the Bronco shotblast machine and Delong shotblast machine at maximum capacity is 3.22 lbs/hr.

Compliance and Performance Test Methods and Procedures:

- If testing is required, particulate matter(PM) emissions shall be determined in accordance with Method 5 of 40 CFR 60, Appendix A. (*ADEM Admin.Code r. 335-3-1-.05*)
- Method 9 of 40 CFR 60, Appendix A, or an equivalent method approved by the Department shall be used in the determination of the opacity of the stack emissions. (*ADEM Admin.Code r. 335-3-1-.05*)

Emission Monitoring:

This unit is subject to the applicable emission monitoring requirements of ADEM Admin. Code r. 335-3-16-.05.

- ADEM Admin. Code r. 335-3-16-.05:
 - The permittee shall perform the following inspections of the baghouse to verify proper operation:
 - 1) Once per month check hopper, fan, and cleaning cycle for proper operation.
 - 2) Once per month perform a visual check of all hoods and ductwork.
 - The permittee shall perform the following inspections of the baghouse to verify proper operation:
 - 1) Once per year inspect baghouse structure, access doors, door seals, and bags.
 - 2) Once per year perform an internal inspection of the baghouse hoppers.

CAM Analysis:

Particulate Matter

- The Goff Shotblast machine is subject to an emission limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;
- The Goff Shotblast machine has a limit on PM emissions of 15.52 (lb/hr) pounds per hour.
- This unit uses a control device (baghouse) to achieve compliance with the PM limitation.

- A baghouse reduces PM emissions with a removal efficiency of 99%.
- The three shotblast machines have potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. For purposes of this paragraph, “potential pre-control device emissions” shall have the same meaning as “potential to emit,” as defined in §64.1, except that emission reductions achieved by the applicable control device shall not be taken into account.
 - Based on an emission test of a similar unit, this **unit has the pre-controlled potential to emit particulate matter equal to or greater than 100 percent of the amount required to be classified as a major source.**
- Since the Goff shotblast machine as a limit on PM emissions of 15.52 lbs/hr, these units do not exceed potential to emit of 100 TPY. Therefore, these units would not be required to collect four or more data values as required in §64.3(b)(4)(i).

Monitoring

- The facility proposes the following monitoring to satisfy the requirements of CAM:

	Indicator 1	Indicator 2
I. Indicator	Differential Pressure	Visible Emission
Measurement Approach	Measured using a Magnehelic Differential Pressure Gauge	Visual inspection of the baghouse stack
II. Indicator Range	While the unit is operation, an excursion is defined as a pressure differential below 2.0 inches of H ₂ O or greater than 7.0 inches of H ₂ O. Excursions trigger an inspection, corrective action, and a reporting requirement.	Baghouse stack visual emission opacity should be less than 5%. Excursions of opacity shall not exceed 10% for more than 4 hrs. Excursions trigger an inspection, corrective action, and a reporting requirement. If an excursion is noted and not corrected within a period of one hour, then a method 9 must be performed with four

		hours of the observation.
III. Performance Criteria		
Data Representativeness	The pressure gauge measures the pressure differential between the inlet and outlet of the baghouse.	Baghouse shell is visually inspected for deterioration. If needed, it is repaired or replaced. Broken or leaking filter bags are replaced.
Verification of Operation Status	Not applicable	Not applicable
QA/QC Practices and Criteria	The pressure gauge shall be calibrated annually. If abnormal pressure is found, the gauge shall be inspected and corrected or replaced.	Opacity readings shall be taken by a person fully trained and qualified according to EPA standards. Gauge calibration shall be conducted when erratic reading are displayed, or at least annually.
Monitoring Frequency	The pressure differential shall be monitored and logged daily.	The complete Baghouse Unit shall be inspected at least annually. The visual emission shall be performed daily.
Data Collection Procedures	The pressure differential will be recorded with the time, date, and name of the observer.	A record of the results of the Baghouse inspection shall be kept with the time, date, bags condition and number replaced.
Averaging Period	Instantaneous	Instantaneous

Justification

Rationale for Selection of Performance Indicators

Visible emissions were selected as a performance indicator because it is indicative of good operation and maintenance of the fabric filter. When the equipment is properly operating, visible emissions will maintain a consistently normal appearance. If the exhaust plume should change in overall appearance, there is a likelihood that the fabric filter may have entered into an upset condition that must be investigated to determine the cause of the abnormal emission. The most likely causes of increased visible emissions from a fabric filter is broken bags or condensation of high moisture content exhaust air.

In general, the fabric filter will operate within a prescribed range of pressure drops based on the airflow being delivered to the equipment. If the pressure drop readings change dramatically or fall outside of the specified range, an investigation must be performed to determine the cause of the change in readings and remedial actions performed, if required. The most likely causes of a change in pressure drop are either broken or blinded filter bags, clogged inlet lines, or a significant reduction in airflow to the collector.

Proper maintenance of the auxiliary equipment is essential to proper operation of the baghouse. Therefore, AFC will conduct weekly inspections of the hopper, fan, cleaning cycle, hoods, and ductwork. Additionally, AFC will complete an internal inspection of all structures, access doors, bags, and hoppers once per twelve month period.

Rationale for Selection of Indicator Ranges

The selected indicator for visible emissions is a change from normal appearance. The observer will be trained to recognize normal emissions from the exhaust so that in the event there is a change in appearance of the exhaust plume; an investigation into its cause can be initiated. Some visible emissions are detected at the exhaust monovalent due to the presence of some particulate not captured on the fabric filter (fabric filter removal efficiency is estimated at 99%). This is considered a normal condition. If a consistent change in the color, consistency, or other appearance feature of the plume is noted, it will be documented as an excursion. When an abnormal condition exists, maintenance will be notified of the excursion, and will instigate an investigation to determine the cause of the visible emission. Once determined, the cause of the excursion will be documented and any necessary maintenance activities required to correct the visible emissions will be scheduled and performed at a time such that the impact to operations are minimized while

insuring that no emissions limits are violated. All results of the investigation and any maintenance activity associated with the correction will be documented. No formal report will be required unless it is determined that an emission limit has been exceeded.

The selected indicator for the fabric filter unit is a pressure drop less than 2.0 inches of H₂O or greater than 7.0 inches of H₂O. Whenever the pressure drop is above or below the range of 2 to 7 inches of H₂O an investigation into its cause will be initiated. The wide range of values is required because of the variability in airflow to the fabric filter unit. Low production will lead to low airflow with high production yielding a corresponding high airflow. If the pressure drop reading has fallen outside of the range, maintenance staff will be notified of the excursion, and will instigate an investigation to determine the cause of the unusual reading. Once determined, the cause of the excursion will be documented and any necessary maintenance activities required to correct the unusual pressure drop will be scheduled and performed. The activities will occur at a time such that the impacts to operations are minimized, while insuring that no emissions limits are violated. All results of the investigation and any maintenance activity associated with the correction will be documented. No formal report will be required unless it is determined that an emission limitation has been exceeded.

Recordkeeping and Reporting Requirements:

- The Permittee shall maintain a record of all inspections performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. (*ADEM Admin. Code r. 335-3-16-.05(c)(3)*).

- This source is subject to the applicable requirements of 40 CFR Part 64, "Compliance Assurance Monitoring" to include the Reporting and Recordkeeping Requirements in §64.9 (40 CFR Part 64 – CAM).
- The Permittee shall record the baghouse pressure daily. Any deviations from the pressure range shall be documented along with the corrective action and reported to the Department within two (2) working days. Each record shall be maintained for a period of 5 years. (40 CFR Part 64 – CAM).

Thermal Reclamation Unit

Mullite grain is processed in a thermal reclamation unit by heating in excess of 1250 °F in an oxidizing atmosphere. The input is mullite grain coated with approximately 0.6% polystyrene acquired by liquefied and condensed foam patterns decomposed by the heat of the molten aluminum poured in the aluminum casting process. Emissions from this unit are styrene monomer, CO₂, and particulate matter, which are collected in the existing baghouse. The reclaimed mullite is cooled and screened and directly resued in the molding system.

Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code r. 335-3-4-.04(1), “Control of Particulate Emissions for Process Industries – General”.
- This process is subject to ADEM Admin. Code r. 335-3-4-.01(1), “Control of Particulate Emissions – Visible Emissions”.

Emissions Standards:

- Opacity
 - ADEM Admin Code r. 335-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) percent opacity, as determined by a six (6) minute average. During one six (6)

minute period a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.

- Particulate Matter
 - Particulate matter emissions from this unit shall not exceed the allowable set by ADEM Admin Code r. 335-3-4-.04(1), which states no person shall cause or permit the emission of particulate matter in excess of the amount for the process weight per hour allocated to such source accomplished by use of the equation:

$$E = 3.59 (P)^{0.62} \text{ (P less than 30 tons per hour)}$$

$$E = 17.31 (P)^{0.16} \text{ (P greater than 30 tons per hour)}$$

Where E = Emissions in pounds per hour

P = Process weight per hour in tons per hour

Expected Emissions

The expected emissions are as follows:

Pollutant	Expected Emissions (lb/hr)	Expected Emissions (TPY)
PM	3.61*	15.8*
Styrene	.021	.091

* The PM allowable for this unit is 5.52 lb/hr.

Expected emissions were calculated based on stack analysis of a similar unit.

Compliance and Performance Test Methods and Procedures:

- If testing is required, particulate matter(PM) emissions shall be determined in accordance with Method 5 of 40 CFR 60, Appendix A. (ADEM Admin.Code r. 335-3-1-.05)

- Method 9 of 40 CFR 60, Appendix A, or an equivalent method approved by the Department shall be used in the determination of the opacity of the stack emissions.
(ADEM Admin. Code r. 335-3-1-.05)

Emission Monitoring:

- Particulate Matter
 - The facility shall perform a visual check, once per day, of the stack associated with this unit. This check shall be performed by a person familiar with method 9. If the instantaneous opacity of emissions in excess of 10% are noted, and are not corrected within a period of 1 hour, then a method 9 must be performed within 4 hours of the observations. Maintenance shall be performed as needed. Any repairs or observed problems shall be recorded (ADEM Admin. Code r. 335-3-16-.05)
 - The facility shall establish a normal operating pressure drop range and shall monitor and record the pressure drop across the baghouse once per day. (ADEM Admin. Code r. 335-3-16-.05)
- ADEM Admin. Code r. 335-3-16-.05:
 - The permittee shall perform the following inspections of the baghouse to verify proper operation:

- 1) Once per month check hopper, fan, and cleaning cycle for proper operation.
 - 2) Once per month perform a visual check of all hoods and ductwork.
- The permittee shall perform the following inspections of the baghouse to verify proper operation:
- 1) Once per year inspect baghouse structure, access doors, door seals, and bags.
 - 2) Once per year perform an internal inspection of the baghouse hoppers.

Recordkeeping and Reporting Requirements:

- The Permittee shall maintain a record of all inspections performed to satisfy the requirements of periodic monitoring. This shall include all problems observed and corrective actions taken. Each record shall be maintained for a period of 5 years. (*ADEM Admin. Code r. 335-3-16-.05(c)(3)*).
- The Permittee shall record the baghouse pressure daily. Any deviations from the pressure range shall be documented along with the corrective action and reported to the Department within two (2) working days. Each record shall be maintained for a period of 5 years. (40 CFR Part 64 – CAM).

Foam Pattern Making Process

Plastic beads containing six percent pentane are partially expanded by conveying them through a steam heated unit. Pentane amounting to five percent of the weight of the bead is driven off in the process. The expanded bead is further expanded by steam in the eps pattern molding machine. The polystyrene dried in an electric heated aging oven, which releases the remaining two percent of pentane. The patterns are then assembled by glue to sprues into clusters. The aged clusters are next dip coated with a slurry of based refractory. Following drying of the refractory coating, the pattern cluster is ready for the aluminum casting operation.

Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code r. 335-3-16-.03, “*Major Source Operating Permits*”.

Emissions Standards:

N/A

Compliance and Performance Test Methods and Procedures:

N/A

Emission Monitoring:

N/A

Recordkeeping and Reporting Requirements:

N/A

Christopher Osborne

Christopher Osborne
Industrial Minerals Section
Energy Branch
Air Division

June 18, 2010

Date